

Documentation for shef_decoder_raw November 2002

1.0 General Information

1.1 Application Description

The primary method of getting data into the RFC Archive database, particularly unprocessed, raw data is via SHEF messages and the shef_decode_raw application. The program is run continuously in the background by the user oper. This shefdecoder is fed the same SHEF products in parallel as the IHFS database's shefdecoder on the AWIPS ds system. This is accomplished with changes to the ack_patterns.txt file at each RFC.

1.2 Design Considerations

Since the archive database design was based on CBRFC's fastetc database, the starting point for the shef_decode_raw application was the shefdecoder used by CBRFC for the fastetc database. While similar to the IHFS shefdecoder, there are differences. One of the most noteable is that there are 90+ error conditions being checked in the IHFS decoder while there are only 40+ being checked in the CBRFC decoder. The error conditions are listed as an attachment.

1.3 Assumptions application makes

General assumptions are that SBN shef messages, metar shef messages, ldam shef messages and WAN shef messages are being directed to the raw

2.0 Configuration Information

Apps_defaults tokens

Tokens used by shef_decoder_raw are listed below.

adb_name	:	adb5_22nhor # archive database name
adb_server	:	adbs1 # archive server name
lookback	:	
lookfwd	:	
adb_raw_que	:	/awips/hydroapps/rfc/local/q/raw/test/in # pathname for shef messages for raw data values

```
adb_pro_QUE      : /awips/hydroapps/rfc/local/q/pro/test/in # pathname for shef  
messages of processed values
```

```
local_ADB_NAME   :  
shef_ProcObs    :  
local_Name_Cfg   :  
local_Name_Dir   :
```

shef_raw.cfg file

```
.  
/usr/shef/q/raw/in  
/usr/shef/q/raw/out  
/usr/shef/q/raw/err  
/usr/shef/lib/shef/inputparm  
/usr/shef/q/raw/logs  
/usr/shef/q/remote/raw/in  
-SHEFOUT  
-ERRORFILE  
+SHEFPASS  
HG PC PP TA SW UQ  
RG RF RH RS RV RM R4 RR RP R1 FA FU FZ RZ
```

inputparm file

This file is read by the shef_decoder_raw program when it is first started. This file contains all the valid SHEF pedtsep codes and information needed to decode and validate SHEF messages. The file is very similar to the shefparm file used by the IHFS db shefdecoder but is not identical. The inputparm provided is based on SHEF version 2.0. and the file also includes the SHEF type/source codes the RFC Archive DB requested and received approval for in 2002. Attachment A contains a description and listing of this file.

command_line_options

The shef_decoder_raw program has a build in help option for the command line arguements, this can be generated by typing: shef_decoder_raw -?

```
shef_decoder_raw -t -at -d -r -v -c CCYR -s -e -p -fcfg filename -informix name -howold # -loop # -y
```

where:

-t	execute test version
-at	turn on advanced testing
-d	turn on debug information
-r	turn on special revision flag
-v	turn on verbose option
-s	create file of unknown stations/sensors (INFORMIX VER)

-c CCYRMMDD	override system date with switch for testing
-e	write all INFORMIX errors to file
-p	only write lines with error when parsing shef
-fcfg filename	input configuration path/filename from command line
-informix name	input database name from command line
-howold #sec	number of seconds to wait before processing a file (default=10)
-y	copy each file to remote directory used to populate other databases
-loop #	# equals the number of iterations (files processed) before stopping (default=150)

3.0 User How-To

Parsing Errors/Warnings

The parsing portion of the shef_decode_raw program is not identical to the IHFS db shefdecoder. While the IFHS db shefdecoder has 90 possible parsing warnings/errors, the archive db shefdecoder has only 40 parsing warnings/errors. The possible parsings warnings/errors are as follows:

<u>Number</u>	<u>Message</u>
1	Error No. 1 ->This line not decoded
2	Error No. 2 ->No space in positional data
3	Error No. 3 ->Less than 3 characters in ID of message source
4	Error No. 4 ->TZ code error
5	Error No. 5 ->Date group error-not enough digits or bad value
6	Error No. 6 ->Illegal character in Id or message source
7	Error No. 7 ->Error in date code
8	Error No. 8 ->Observation time error
9	Error No. 9 ->Date relative code error
10	Error No. 10 ->Julian day error ;
11	Error No. 11 ->Illegal data string qualifier
12	Error No. 12 ->Units code error",sizeof(err3_.message12));
13	Error No. 13 ->Not a date or data type element
14	Error No. 14 ->Not a date or data type...maybe missing slash",sizeof(err3_.message14));
15	Error No. 15 ->Illegal character in parameter code
16	Error No. 16 ->File read error on shef_parm
17	Error No. 17 ->Non-existent parameter code
18	Error No. 18 ->Parameters coded with a send code
19	Error No. 19 ->Continuation of a format does not follow the correct format
20	Error No. 20 ->A format revision continuation follows an original
21	Error No. 21 ->The format that this is continuing had an error
22	Error No. 22 ->Year not in the range 1976-2020 for local time zone use Z for time zone for historical data
23	Warnng No. 23 ->Forecast data without creation date

24 Error No. 24 ->Bad data somehow
25 Error No. 25 ->DV not defined for ZZV
26 Error No. 26 ->DV code error ;
27 Error No. 27 ->DI code error
28 Error No. 28 ->Trace specified for other than PP,PC,SF,SD or SW
29 Error No. 29 ->No time increment specified
30 Error No. 30 ->Too many items in .B body line
31 Error No. 31 ->Bad character in the line
32 Warng No. 32 ->Not enough items in .B body line
33 Error No. 33 ->No value specified
34 Error No. 34 ->No .END at end of .B ;
35 Error No. 35 ->Zulu,DR or DI coded with send code QY,PY or HY
36 Error No. 36 ->The explicit date referenced by DRE is not the end of the month
37 Error No. 37 ->Obervation or creation time is between 020001 and 025959
371, " on the date of change from standard to daylight time
38 Warning No.38 ->No check for daylight savings time-year out of bounds [1976-2020]",sizeof(err8_.message38));
39 Error No. 39 ->Embedded database comments with internal comments not allowed",sizeof(err8_.message39));
40 Error No. 40 ->Database comment too long",sizeof(err8_.message40));

Posting Warnings/Errors

??? are there any

4.0 Log File

The shef_decoder_raw program generates a daily log file. The format of this log file is based on the CBRFC shefdecoder for the fastetc db. This stays static in size and reports information on how many values for various SHEF codes were processed. An example of this log file is shown in Attachment B..

5.0 Troubleshooting Information

6.0 Installation Instructions

“under construction”

7.0 Maintenance Information

Originating Programmer/Office: Toth, Monica

NWS/OHD/HL
Silver Spring, MD

Maintenance programmer/Office: NWS/OHD/HL
Silver Spring, MD

8.0 References

NWS Manual 10-942 Standard Hydrometeorological Exchange Format (SHEF) Manual

RFC Archive DB Team Request for Change to SHEF submitted February 28, 2002.

Attachment A - inputparm file

File Description

The file is a ASCII text file with the following record structure:

<u>Columns</u>	<u>Contents</u>
----------------	-----------------

Command card (indicates which parameters are to follow):

1-2	*n where n is one of the following: 1 = Physical element codes 2 = Duration codes 3 = Type/Source codes 4 = Extremum codes 5 = Probability codes 6 = Send codes or duration defaults * = end of data
4	0

Physical element codes:

1-2	Physical element code
4-23	Conversion factor metric to English

Duration codes:

1	Duration code
4-8	The integer translation of the duration code

Type/Source codes:

1-2	Type/Source code
4-5	1.0 to indicate it is used

Extremum codes:

1	Extremum code
4-5	1.0 to indicate it is used

<u>Columns</u>	<u>Contents</u>
----------------	-----------------

Probability codes:

1	Probability code
3-22	The equivalent probability

Send codes or duration defaults:

1-2	Physical element or send code
4-11	The fully expanded parameter code for send codes or the three-character 'PED' combination for duration defaults
12-13	For send codes, place a '1' in this column if the observe time is

the previous 7 AM otherwise place a '0' in this column

Comments any comments included in the file must be after the ** 0 line.

File Listing

```
*1 0
AD 1.0
AF 1.0
AG 1.0
AM 1.0
AT 1.0
AU 1.0
AW 1.0
BA 0.0393701
BB 0.0393701
BC 0.0393701
BD -1.0
BE 0.0393701
BF 0.0393701
BG 1.0
BH 0.0393701
BI 0.0393701
BJ 0.0393701
BK 0.0393701
BL 0.0393701
BM 0.0393701
BN 0.0393701
BO 0.0393701
BP 0.0393701
BQ 0.0393701
CA 0.0393701
CB 0.0393701
CC 0.0393701
CD 0.0393701
CE 0.0393701
CF 0.0393701
CG 0.0393701
CH 0.0393701
CI 0.0393701
CJ 0.0393701
CK 0.0393701
CL -1.0
CM -1.0
CN 1.0
CO 1.0
CP 0.0393701
CQ 0.0393701
CR 0.0393701
CS 0.0393701
CT 1.0
CU -1.0
CV -1.0
CW 0.0393701
CX 0.0393701
CY 0.0393701
CZ 1.0
```

EA 0.0393701
ED 0.0393701
EM 0.0393701
EP 0.0393701
ER 0.0393701
ET 0.0393701
EV 0.0393701
FA 1.0
FB 1.0
FC 1.0
FE 1.0
FK 1.0
FL 1.0
FP 1.0
FS 1.0
FT 1.0
FZ 1.0
GD 0.3937008
GR 1.0
GS 1.0
GT 0.3937008
HA 3.2808399
HB 3.2808399
HC 3.2808399
HD 3.2808399
HE 3.2808399
HF 3.2808399
HG 3.2808399
HH 3.2808399
HI 1.0
HJ 3.2808399
HK 3.2808399
HL 3.2808399
HM 3.2808399
HN 3.2808399
HO 3.2808399
HP 3.2808399
HQ 1.0
HR 3.2808399
HS 3.2808399
HT 3.2808399
HU 3.2808399
HW 3.2808399
HX 3.2808399
HY 3.2808399
HZ 3.2808399
IC 1.0
IE 0.6213712
IO 3.2808399
IR 1.0
IT 0.3937008
LA 247.10541
LC 0.8107131
LS 0.8107131
MD 1.0
MI 1.0
ML 0.3937008
MM 1.0
MN 1.0
MS 1.0
MT -1.0

MU 0.3937008
MV 1.0
MW 1.0
NC 1.0
NG 3.2808399
NL 1.0
NN 1.0
NO 1.0
NS 1.0
PA 0.295297
PC 0.0393701
PD 0.295297
PE 1.0
PL 10.
PF 0.0393701
PM 1.0
PN 0.0393701
PP 0.0393701
PR 0.0393701
PT 1.0
PY 0.0393701
QA 0.0353147
QB 0.0393701
QC 0.8107131
QD 0.0353147
QE 1.0
QF 0.6213712
QG 0.0353147
QI 0.0353147
QL 0.0353147
QM 0.0353147
QN 0.0353147
QP 0.0353147
QR 0.0353147
QS 0.0353147
QT 0.0353147
QU 0.0353147
QV 0.8107131
QW 0.0353147
QX 0.0353147
QY 0.0353147
RA 1.0
RI 1.0
RN 1.0
RP 1.0
RT 1.0
RW 1.0
SA 1.0
SD 0.3937008
SF 0.3937008
SI 0.3937008
SL 0.00328084
SR 1.0
SS 1.0
ST 1.0
SW 0.0393701
TA -1.0
TB 1.0
TC -1.0
TD -1.0
TE 1.0

TF -1.0
TH -1.0
TM -1.0
TN -1.0
TP -1.0
TS -1.0
TV 1.0
TW -1.0
TX -1.0
UC 0.6213712
UD 1.0
UG 2.2369363
UL 0.6213712
UP 1.0
UQ 1.0
UR 1.0
US 2.2369363
VB 1.0
VC 1.0
VE 1.0
VG 1.0
VH 1.0
VJ 1.0
VK 1.0
VL 1.0
VM 1.0
VP 1.0
VQ 1.0
VR 1.0
VS 1.0
VT 1.0
VU 1.0
VW 1.0
WA 1.0
WC 1.0
WD 0.3937008
WG .0393701
WH 1.0
WL 1.0
WO 1.0
WP 1.0
WT 1.0
WV 3.2808399
XC 1.0
XG 1.0
XL 1.0
XP 1.0
XR 1.0
XU 2.2883564
XV 0.6213712
XW 1.0
YA 1.0
YC 1.0
YF 1.0
YR 1.0
YS 1.0
YT 1.0
*2 0
A 1008
B 1002
C 0015

D	2001
F	1004
H	1001
I	0000
J	0030
K	1012
L	1018
M	3001
N	2015
P	5004
Q	1006
R	5002
S	5001
T	1003
U	0001
V	5003
W	2007
X	5005
Y	4001
Z	5000
*3	0
1G	1
1M	1
1P	1
1R	1
1Z	1
2G	1
2M	1
2P	1
2R	1
2Z	1
3G	1
3M	1
3P	1
3R	1
3Z	1
4G	1
4M	1
4P	1
4R	1
4Z	1
5G	1
5M	1
5P	1
5R	1
5Z	1
6G	1
6M	1
6P	1
6R	1
6Z	1
7G	1
7M	1
7P	1
7R	1
7Z	1
8G	1
8M	1
8P	1
8R	1
8Z	1

9G	1
9M	1
9P	1
9R	1
9Z	1
C1	1
C2	1
C3	1
C4	1
C5	1
C6	1
C7	1
C8	1
C9	1
CA	1
CB	1
CC	1
CD	1
CE	1
CF	1
CG	1
CH	1
CI	1
CJ	1
CK	1
CL	1
CM	1
CN	1
CO	1
CP	1
CQ	1
CR	1
CS	1
CT	1
CU	1
CV	1
CW	1
CX	1
CY	1
CZ	1
FA	1
FB	1
FC	1
FD	1
FE	1
FF	1
FG	1
FM	1
FN	1
FP	1
FQ	1
FU	1
FV	1
FW	1
FX	1
FZ	1
HA	1
HB	1
HC	1
HD	1
HE	1

HF	1
HG	1
HH	1
HI	1
HJ	1
HK	1
HL	1
HM	1
HN	1
HO	1
HP	1
HQ	1
HR	1
HS	1
HT	1
HU	1
HV	1
HW	1
HX	1
HY	1
HZ	1
MA	1
MC	1
MH	1
MK	1
MS	1
MT	1
MW	1
PA	1
PB	1
PC	1
PD	1
PE	1
PF	1
PG	1
PH	1
PI	1
PJ	1
PK	1
PL	1
PM	1
PN	1
PO	1
PP	1
PQ	1
PR	1
PS	1
PT	1
PU	1
PV	1
PW	1
PX	1
PY	1
PZ	1
R2	1
R3	1
R4	1
R5	1
R6	1
R7	1
R8	1

R9	1
RA	1
RB	1
RC	1
RD	1
RF	1
RG	1
RM	1
RP	1
RR	1
RS	1
RT	1
RV	1
RW	1
RX	1
RZ	1
ZZ	1
*4	0
D	1
E	1
F	1
G	1
H	1
I	1
J	1
K	1
L	1
M	1
N	1
P	1
R	1
S	1
T	1
U	1
V	1
W	1
X	1
Y	1
Z	1
*5	0
A	0.002
B	0.004
C	0.01
D	0.02
E	0.04
F	0.05
G	0.25
H	0.75
J	0.0013
K	0.0228
L	0.1587
M	-0.5
N	0.8413
P	0.9772
Q	0.9987
T	0.95
U	0.96
V	0.98
W	0.99
X	0.996
Y	0.998

```
Z -1.0
1 0.1
2 0.2
3 0.3
4 0.4
5 0.5
6 0.6
7 0.7
8 0.8
9 0.9
*6 0
AD ADZZZZ 0
AT ATD 0
AU AUD 0
AW AWD 0
EA EAD 0
EM EMD 0
EP EPD 0
ER ERD 0
ET ETD 0
EV EVD 0
HY HGIRZZZ 1
HN HGIRZNZ 0
HX HGIRZXZ 0
LC LCD 0
PF PPTCF 0
PP PPD 0
PR PRD 0
PY PPDRZZZ 1
QC QCD 0
QN QRIRZNZ 0
QV QVZ 0
QX QRIRZXZ 0
QY QRIRZZZ 1
RI RID 0
RP RPD 0
RT RTD 0
TC TCS 0
TF TFS 0
TH THS 0
TN TAIRZNZ 0
TX TAIRZXZ 0
SF SFD 0
UC UCD 0
UL ULD 0
XG XGJ 0
XP XPQ 0
** 0
```

If altering this file, be very careful!
The program looks for the key delimiters,
*1, *2, *3, *4, *5, *6, **. Values can be
added in between the delimiters. The input
file ends with **.

The program, is currently set to handle
the following number of values:

```
PE 250
D 35
TS 180
E 30
```

P 40
SEND 45

If you want more, you will need to increase
the array sizes in the program, and recompile.

When adding send codes in the section
beginning with *6, be sure to enter all
three values on each line entered. The
three values should be the 2 character
send code, the translated PEDSTEP, followed
by either a 0 or 1, depending upon if the
sendflag is off or on.

Attachment B - Example Log File

LOG FOR SHEF PARSING & POSTING - Program: shef_decode_raw
LOG_START_TIME-----> 00:00 10/11/02 (1034294401)
LOG_CURRENT_TIME-----> 18:07 10/11/02 (1034359627)

< PARSING STATISTICS >

#PRODUCTS	#RECORDS	#ERRORS	#WARNINGS
2418	171424	635	691

< INSERT/UPDATE RECORDS STATISTICS >

#INSERTS	#UPDATES
4085	37147

< ARRAY POSTING STATISTICS >

S.DOM	R.DOM	HADSAALERT#2	MTR	SNOTEL	ROSAALERT#1	LARCS	RR	#F		
ADDJ1F	UADJ1	FUTUREDEFAULT								
PE	RG	RF	RH	RS	RV	RM	R4	RR	RP	R1
FA	FU	FZ	RZ	TOTALS						
HG	0	0	3041	0	0	0	0	210	511	0
0	0	0	2218	5980						
PC	0	0	700	0	0	0	0	1	182	0
0	0	0	0	883						
PP	0	0	179	0	0	0	0	4418	0	0
0	0	254	3282	8133						
TA	0	0	0	0	0	0	0	0	0	0
0	0	0	700	700						
SW	0	0	0	0	0	0	0	0	0	0
0	0	0	7	7						
UQ	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0						
		0	3920	0	0	0	0	4629	693	0
0	0	254	6207	15703						

00:00	00:00	18:04	00:00	00:00	00:00	00:00	18:04	17:51	00:00
00:00	00:00	15:01	18:00						

Attachment B - Example Log File

```
/* Error Messages */

"Error No. 1 ->This line not decoded"
"Error No. 2 ->No space in positional data"
"Error No. 3 ->Less than 3 characters in ID of message source"
"Error No. 4 ->TZ code error",sizeof( err1_.message4));
    strncpy( err1_.message5, "Error No. 5 ->Date group error-not
enough digits or bad value",sizeof( err1_.message5));
    strncpy( err2_.message6, "Error No. 6 ->Illegal character in
Id or message source",sizeof(err2_.message6) );
    strncpy( err2_.message7, "Error No. 7 ->Error in date
code",sizeof( err2_.message7));
    strncpy( err2_.message8, "Error No. 8 ->Observation time
error",sizeof(err2_.message8) );
    strncpy( err2_.message9, "Error No. 9 ->Date relative code
error",sizeof(err2_.message9) );
    strncpy( err2_.message10, "Error No. 10 ->Julian day
error",sizeof( err2_.message10));
    strncpy( err3_.message11, "Error No. 11 ->Illegal data string
qualifier",sizeof(err3_.message11) );
    strncpy( err3_.message12, "Error No. 12 ->Units code
error",sizeof( err3_.message12));
    strncpy( err3_.message13, "Error No. 13 ->Not a date or data
type element",sizeof(err3_.message13) );
    strncpy( err3_.message14, "Error No. 14 ->Not a date or data
type...maybe missing slash",sizeof(err3_.message14));
    strncpy( err3_.message15, "Error No. 15 ->Illegal character in
parameter code",sizeof(err3_.message15) );
    strncpy( err4_.message16, "Error No. 16 ->File read error on
shef_parm",sizeof(err4_.message16) );
    strncpy( err4_.message17, "Error No. 17 ->Non-existent
parameter code",sizeof(err4_.message17) );
    strncpy( err4_.message18, "Error No. 18 ->Parameters coded with
a send cod",sizeof( err4_.message18));
    strncpy( err4_.message19, "Error No. 19 ->Continuation of a
format does not follow the correct format",sizeof(err4_.message19));
```

```
        strncpy( err5_.message23, "Warnng No. 23 ->Forecast data without
creation date",sizeof( err5_.message23));
        strncpy( err5_.message24, "Error No. 24 ->Bad data
somehow",sizeof(err5_.message24) );
        strncpy( err5_.message25, "Error No. 25 ->DV not defined for
ZZV",sizeof(err5_.message25) );
        strncpy( err6_.message26, "Error No. 26 ->DV code
error",sizeof(err6_.message26) );
        strncpy( err6_.message27, "Error No. 27 ->DI code
error",sizeof(err6_.message27) );
        strncpy( err6_.message28, "Error No. 28 ->Trace specified for
other than PP,PC,SF,SD or SW",sizeof(err6_.message28));
        strncpy( err6_.message29, "Error No. 29 ->No time increment
specified",sizeof(err6_.message29) );
        strncpy( err6_.message30, "Error No. 30 ->Too many items in .B
body line",sizeof( err6_.message30));
        strncpy( err7_.message31, "Error No. 31 ->Bad character in the
line",sizeof(err7_.message31) );
        strncpy( err7_.message32, "Warnng No. 32 ->Not enough items in
.B body line",sizeof(err7_.message32) );
        strncpy( err7_.message33, "Error No. 33 ->No value
specified",sizeof( err7_.message33));
        strncpy( err7_.message34, "Error No. 34 ->No .END at end of
.B",sizeof( err7_.message34));
        strncpy( err7_.message35, "Error No. 35 ->Zulu,DR or DI coded
with send code QY,PY or HY",sizeof(err7_.message35));
        strncpy( err8_.message36, "Error No. 36 ->The explicit date
referenced by DRE is not the end of the month",sizeof(err8_.message36));
        strncpy( err8_.message37, "Error No. 37 ->Obervation or
creation time is between 020001 and 025959",sizeof(err8_.message37));
        strncpy( err8_.message371, "on the date of change from standard
to daylight time",sizeof(err8_.message371) );
        strncpy( err8_.message38, "Warning No.38 ->No check for
daylight savings time-year out of bounds [1976-2020]",sizeof(err8_.message38));
        strncpy( err8_.message39, "Error No. 39 ->Embedded database
comments with internal comments not allowed",sizeof(err8_.message39));
        strncpy( err8_.message40, "Error No. 40 ->Database comment too
long",sizeof(err8_.message40));
```